CLAIMS:

I claim:

1. An anti-islanding apparatus for isolating a power source from a failed electrical grid, comprising:
a power converter connectable between said power source and said grid;
a means for measuring a voltage of said grid;
a means for calculating a voltage trend in said grid voltage, using a present grid voltage measurement and a prior grid voltage measurement;
a means for calculating a positive feedback power converter control signal based on said voltage trend;
a control circuit connected to said power converter, wherein said control circuit applies said control signal to said power converter; and
a means of disconnecting said power source from said grid when said present grid voltage is outside pre-defined limits.

2. An anti-islanding apparatus according to claim 1, wherein said control signal comprises an acceleration function.

3. An anti-islanding apparatus according to claim 1, further comprising a means for measuring a frequency of said grid;
a means for calculating a frequency trend in said grid frequency using a present grid frequency measurements and a prior grid frequency measurement;
a means for calculating said positive feedback power converter control signal based on said frequency trend; and
a means of disconnecting said power source from said grid when said present grid frequency is outside pre-defined limits.

4. An anti-islanding apparatus according to claim 3, wherein said control signal comprises an acceleration function.

5. An anti-islanding apparatus according to claim 1, wherein when said power source is operating in a power limited condition, said control signal commands a lower power output in all cases.

6. An anti-islanding apparatus according to claim 1, wherein said means for measuring operates continuously.

7. An anti-islanding apparatus according to claim 1, wherein said means for measuring operates at intermittent intervals.

8. An anti-islanding apparatus for isolating a power source from a failed electrical grid, comprising:
a power converter connectable between said power source and said grid;
a means for measuring a frequency of said grid;
a means for calculating a frequency trend in said grid frequency using a present grid frequency measurements and a prior grid frequency measurement;
a means for calculating a positive feedback power converter control signal based on said frequency trend;
a control circuit connected to said power converter, wherein said control circuit applies said control signal to said power converter; and
a means of disconnecting said apparatus from said grid when said present grid frequency is outside pre-defined limits.

9. An anti-islanding apparatus according to claim 8, wherein a grid phase is calculated from said grid frequency.

10. An anti-islanding apparatus according to claim 8, wherein said means of measuring operates continuously.

11. An anti-islanding apparatus according to claim 8, wherein said means of measuring operates at intermittent intervals.

12. A method of preventing islanding of a power source on a distributed grid comprising the steps:
measuring grid voltage;
calculating a voltage trend in said grid voltage, using a present grid voltage measurement and a prior grid voltage measurement;
calculating a power converter control signal in a same direction as said voltage trend;
applying said power converter control signal to said power converter; and
disconnecting said power source when said present grid voltage measurement is outside acceptable limits.

13. An anti-islanding apparatus according to claim 12, further comprising:
measuring grid frequency;
calculating a frequency trend in said grid frequency, using a present grid frequency measurement and a prior grid frequency measurement;
calculating a power converter control signal in a same direction as said frequency trend;
applying said control signal to said power converter; and
disconnecting said power source when said present grid frequency measurement is outside acceptable limits.

14. A method of preventing islanding of a power source on a distributed grid according to claim 12, wherein said calculation of power converter control signal uses an accelerating function.

15. A method of preventing islanding of a power source on a distributed grid according to claim 12, further comprising;

measuring grid phase;
calculating a phase trend in said grid phase, using a present grid phase measurement and a prior grid phase measurement;
calculating a power converter control signal in a same direction as said phase trend;
applying said control signal to said power converter; and
disconnecting said power source when said present grid frequency measurement is outside acceptable limits.

16. A method of preventing islanding of a power source on a distributed grid according to claim 12, wherein said steps of measuring, calculating, processing, calculating and applying are performed continuously.

17. A method of preventing islanding of a power source on a distributed grid according to claim 12, wherein said steps of measuring, calculating, processing, calculating and applying are performed at intermittent intervals.

18. A method of preventing islanding of a power source on a distributed grid according to claim 14, wherein said acceleration function is comprised of linear, exponential, and geometric functions.

19. A method of preventing islanding of a power source on a distributed grid according to claim 12, wherein said power converter control signal lowers voltage in a power limited source.

20. A method of preventing islanding of a power source on a distributed grid comprising the steps:
measuring grid frequency;
calculating a frequency trend in said grid frequency, using a present grid frequency measurement and a prior grid frequency measurement;

calculating a power converter control signal in a same direction as said frequency trend;

applying said control signal to said power converter; and

disconnecting said power source when said present grid frequency measurement is outside acceptable limits.